






# Work Order ID 70254



Thursday, June 02, 2011 8:25:54 AM



Page 1


Item ID: D6104-005 Accept  Setup Start   
Revision ID: Stop   
Item Name: Round Billet, 17-4  
Start Date: 6/2/2011 Start Qty: 12.00  Cust Item ID:  
Required Date: 6/16/2011 Req'd Qty: 12.00  Customer:


## Reference:


Approvals: Process Plan: CL Date: 11/06/02 Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start   
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop 

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D6104	Rev B

100	PURCHASING	0.00							
	Purchasing	0.00							
Purchasing	Memo								
	Issue P/O: <u>14226</u> □a)Description: S.S round billet □b) Ø4.00" x 5.10" long □c) Tolerance on all dimensions are +0.030"/-0.000" □d) Material: 17-4PH Stainless steel (Ams 5643 or Aisi 630) □e)One blank makes 2 parts □f) Material certification required								

110	Receive & Inspect for Damage & Mat'l Certs	0.00							
	Packaging	0.00							
Packaging	Memo								
	Ensure material certification is attached								

120	QC6- Inspect dimensions to drawing	0.00							
	QC	0.00							
Quality Control	Memo								
	Ensure Material certification comply to Dwg D6104								

CL 11/06/02 (12)

P 6/4/14 (12)

11/06/14 (12)

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

Thursday, June 02, 2011 8:25:54 AM



**Accept**



**Setup Start**



**Stop**



**Start Date:** 6/2/2011      **Start Qty:** 12.00

**Cust Item ID:**

**Required Date:** 6/16/2011      **Req'd Qty:** 12.00



**Customer:**

**Reference:**

Run Start



**Approvals:**      **Process Plan:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **Tooling:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Stop**



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Operation	Description
1	Start at node A
2	Move to node B
3	Move to node C
4	Move to node D
5	Move to node E
6	Move to node F
7	Move to node G
8	Move to node H
9	Move to node I
10	Move to node J
11	Move to node K
12	Move to node L
13	Move to node M
14	Move to node N
15	Move to node O
16	Move to node P
17	Move to node Q
18	Move to node R
19	Move to node S
20	Move to node T
21	Move to node U
22	Move to node V
23	Move to node W
24	Move to node X
25	Move to node Y
26	Move to node Z
27	Move to node AA
28	Move to node AB
29	Move to node AC
30	Move to node AD
31	Move to node AE
32	Move to node AF
33	Move to node AG
34	Move to node AH
35	Move to node AI
36	Move to node AJ
37	Move to node AK
38	Move to node AL
39	Move to node AM
40	Move to node AN
41	Move to node AO
42	Move to node AP
43	Move to node AQ
44	Move to node AR
45	Move to node AS
46	Move to node AT
47	Move to node AU
48	Move to node AV
49	Move to node AW
50	Move to node AX
51	Move to node AY
52	Move to node AZ
53	Move to node BA
54	Move to node BB
55	Move to node BC
56	Move to node BD
57	Move to node BE
58	Move to node BF
59	Move to node BG
60	Move to node BH
61	Move to node BI
62	Move to node BJ
63	Move to node BK
64	Move to node BL
65	Move to node BM
66	Move to node BN
67	Move to node BO
68	Move to node BP
69	Move to node BQ
70	Move to node BR
71	Move to node BS
72	Move to node BT
73	Move to node BU
74	Move to node BV
75	Move to node BW
76	Move to node BX
77	Move to node BY
78	Move to node BZ
79	Move to node CA
80	Move to node CB
81	Move to node CC
82	Move to node CD
83	Move to node CE
84	Move to node CF
85	Move to node CG
86	Move to node CH
87	Move to node CI
88	Move to node CJ
89	Move to node CK
90	Move to node CL
91	Move to node CM
92	Move to node CN
93	Move to node CO
94	Move to node CP
95	Move to node CQ
96	Move to node CR
97	Move to node CS
98	Move to node CT
99	Move to node CU
100	Move to node CV
101	Move to node CW
102	Move to node CX
103	Move to node CY
104	Move to node CZ
105	Move to node DA
106	Move to node DB
107	Move to node DC
108	Move to node DD
109	Move to node DE
110	Move to node DF
111	Move to node DG
112	Move to node DH
113	Move to node DI
114	Move to node DJ
115	Move to node DK
116	Move to node DL
117	Move to node DM
118	Move to node DN
119	Move to node DO
120	Move to node DP
121	Move to node DQ
122	Move to node DR
123	Move to node DS
124	Move to node DT
125	Move to node DU
126	Move to node DV
127	Move to node DW
128	Move to node DX
129	Move to node DY
130	Move to node DZ
131	Move to node EA
132	Move to node EB
133	Move to node EC
134	Move to node ED
135	Move to node EE
136	Move to node EF
137	Move to node EG
138	Move to node EH
139	Move to node EI
140	Move to node EJ
141	Move to node EK
142	Move to node EL
143	Move to node EM
144	Move to node EN
145	Move to node EO
146	Move to node EP
147	Move to node EQ
148	Move to node ER
149	Move to node ES
150	Move to node ET
151	Move to node EU
152	Move to node EV
153	Move to node EW
154	Move to node EX
155	Move to node EY
156	Move to node EZ
157	Move to node FA
158	Move to node FB
159	Move to node FC
160	Move to node FD
161	Move to node FE
162	Move to node FF
163	Move to node FG
164	Move to node FH
165	Move to node FI
166	Move to node FJ
167	Move to node FK
168	Move to node FL
169	Move to node FM
170	Move to node FN
171	Move to node FO
172	Move to node FP
173	Move to node FQ
174	Move to node FR
175	Move to node FS
176	Move to node FT
177	Move to node FU
178	Move to node FV
179	Move to node FW
180	Move to node FX
181	Move to node FY

### Set Up/ Run Hours

**Tool ID****Tool #**

**Plan  
Code**

**Accept  
Qty**

Reject  
QtyReject  
NumberInsp.  
Stamp

130

Identify as per dwg & Stock Location: QC

0.00



### Packaging

## Memo

0.00

## Packaging

140

QC21- Final Inspection - Work Order Release

0,00



QC

## Memo

0.00

## Quality Control

11/6/15

PL 11-06-15  
(12)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action      Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Picklist Print

Thursday, June 02, 2011 8:25:50 AM

Page 1

Work Order ID: 70254

Parent Item: D6104-005

Parent Item Name: Round Billet, 17-4





Start Date: 6/2/2011

Required Date: 6/16/2011

Start Qty: 12.00

Required Qty: 12.00

Comments: IPP A: ☐01.05.08☐New Issue EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6104-005P  17-4 SS Roundbar 4.00"OD		Purchased	No			110	Each	0.0000	1 	12			

*P. 6/4/11 (12)*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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**NOTE:** Date & initial all entries

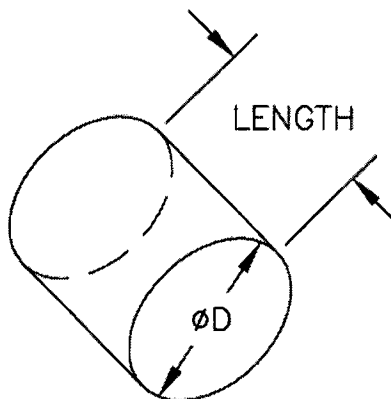


DESIGN <i>RT</i>	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4	SCALE NTS
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED

02.11.29 *[Signature]*

## SPECIFICATION CONTROL DRAWING



MATERIAL: 17-4 PH SS (~~AMS 5643~~ OR ~~AISI 630~~) MIN UTS = 170 KSI (38 HRC)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

*CL 1106101*  
*WIO: 70254*

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
<del>D6104-005</del>	<del>17-4 PH STAINLESS STEEL</del>	<del>Ø4.00</del>	<del>5.10</del>
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

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Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID PO14226

Purchase Order Date 6/2/2011

PO Print Date 6/2/2011

Page Number 1 of 1

Order From : VC-MET001  
METAUX CASTLE  
A.M. CASTLE & CO. (CANADA) INC. - BOX B9204 PO BOX 9100  
TORONTO, ON M4Y 3A5  
CA

Contact Name		Buyer	Chantal Lavoie
Vendor Phone	514 694 9575	Requisition Nbr	
Vendor Fax	514 695 3281	Tax Resale Nbr	10127-2607
Vendor Account Nbr		Terms	Net 30
		Currency	CAD
		FOB	Destination-Collect

Ship To : DART AEROSPACE LTD 1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

EX 11/06/02

Line Nbr	Reference Revision ID Vendor Part Number	Description/ Mfg ID	Req Date/ Taxable	Req Qty/ Unit of Measure	Ship Method	Unit Price	Extended Price
1	D6104-005P	17-4 SS Roundbar 4.00"OD	6/16/2011 Yes	12.00 Each	Yours ppd	\$78.8000	\$945.60

Special Inst: AS PER DWG D6104 REV. B  
B70254

PO Total: \$945.60

MATERIAL CERTIFICATION  
REQ'D UPON DELIVERY

Change Nbr: 1

Change Date: 6/2/2011

No substitution or deviation without  
consent.  
Certificate of Conformity or Material  
Certification required when applicable



**Castle Metals®**

A. M. Castle &amp; Co.

**PACKING SLIP**

Page 1 of 1

Shipment No:849444

<b>Ship From:</b> A. M. Castle & Co. (Canada) Inc. MONTREAL 835-SELKIRK AVENUE POINTE CLAIRE, QUEBEC H9R 3S2		<b>Sold To:</b> DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA		<b>Ship To:</b> DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA		<b>Deliver To:</b> DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA	
<b>Date Shipped</b> 13-JUN-2011	<b>F.O.B.</b> ORIGIN	<b>Freight Terms</b> Prepaid		<b>Carrier</b> MANITOULIN		<b>BOL No</b> 849444-2	

<b>Shipment Details</b>	<b>Final Destination Branch - MON</b>
-------------------------	---------------------------------------

Order No	Line No	Item No	Description				
1505091	1	42464.MO	4.0000.RD.17CR-4NI.STAINLESS.RT.SOL TR.COND A.132.0000-156.0000 CUT TO 5.1 IN ( + .1250/- .0000 IN) - BAND SAW CUTTING SPECIFICATIONS: AMS 5643				
Purchase Order No		Part Number		Ordered Qty		Invoice Qty	
14226		YOUR ITEM NUMBER: D6104-005		12 PCS		12 PCS	
Details							
Delivery No.	Mill	Heat Number	Mech Id	PCS	Width (IN)	Length (IN)	Shipped Qty(LBS)
82073317		7RC1		12			224.75

These commodities/technologies are subject to US Export Administration & US State Dept. Regulations and, if intended for export, were/are exported thereunder. Diversion contrary to US Law is Prohibited.

We hereby certify the material covered by this certification conforms in accordance with the above specifications and has been found to meet the applicable requirements for the material, including any specifications forming a part of the description. Test reports are on file subject to examination. All claims for defective material are waived unless made in writing to A.M. Castle & Co. within 60 days of the shipment. Material cut to the correct size, or material cut by the customer cannot be returned for credit.

Reviewed by Authorized Castle Metals Representative:

Date:





NORTH AMERICAN  
STAINLESS

# METALLURGICAL TEST REPORT

6870 Highway 42 East  
Ghent, KY 41045-9615  
(502) 347-6000

Certificate: 631312 01	Mail To: A.M. CASTLE AND COMPANY 3400 NORTH WOLF ROAD FRANKLIN PARK IL 60131	Ship To: A.M. CASTLE AND COMPANY 3400 NORTH WOLF ROAD FRANKLIN PARK IL 60131	Date: 3/27/2011 Page: 1 Of 1
Customer: 0032 001			Steel: 630(17-4)
NAS Order: LN 69062 2			Finish: Hot Finish
Your Order: 88655	Item Code: 42464		Dia/Thk: 4.0000 in
			Leg Length:
			Length: 144.00 in
			Corrosion:

## PRODUCT DESCRIPTION:

AMS 2303E, ~~AMS 5643R~~  
Round Bar, Hot Rolled, Annealed, Rough Turned  
UNS S17400; EN 10204 3.1B, ASTM A484/08  
ASTM A564/04 ASME-SA564-07

## REMARKS:

COMPLIES W/REQUIREMENTS OF DFARS EU DIRECTIVE 2002.95.  
EC. RoHS. EAF+AOD+CC. NO WELD REPAIR. MELTED AND MFG IN USA  
FREE FROM MERCURY AND LOW MELTING ALLOY CONTAMINATION

Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight
BD64918	2564								

## CHEMICAL ANALYSIS CM(Country of Melt) ES(Spain) US(United States) ZA(South Africa) JP(Japan)

Heat	Supplier #	CM	C	CB	CO	CR	CU	MN	MO	N	NI	P
7RC1		US	.046	.231	.05	15.22	3.13	.58	.17	.033	4.23	.028
			S	SI	TA	TI						
			.0097	.49	.0050	.0020						

## MECHANICAL PROPERTIES

	1 d o i c f	HB No.	Ferr %	TS-C KSI	YS-C KSI	El-C %	RA-C %	RC-C No.	FREQ No.	SEV. No.
BD64918	R L	353.0	.60	197.71	175.06	13.48	47.36	42.0	.10	.07

NAS hereby certifies that the analysis on this certification is correct and the material meets the specifications stated.

QC ENGINEER

ERIC HESS



Castle Metals FP

HEAT NUMBER 71221  
MECHANICAL ID 42464  
ITEM CODE             
LOT NUMBER             
PO NUMBER 886055  
RECEIPT DATE 3-31-2011  
SUPPLIER NAS  
SPECIFICATION             
LCS ND  
COMMENT             
APPROVED PL

